

CLAIMS

I claim:

1. A method up-sampling a compressed bitstream, comprising:
 - partially decoding the compressed bitstream to produce a plurality of macroblocks, each macroblock having DCT coefficients according to a predetermined dimensionality of the macroblock; and
 - applying a plurality of DCT filters to the DCT coefficients of each macroblock to generate a plurality of up-sampled macroblocks for each macroblock, there being one up-sampled macroblock generated by each filter, each up-sampled macroblock having the predetermined dimensionality.
2. The method of claim 1 wherein the macroblock and each up-sampled macroblock has 2^N pixels arranged in rows and columns.
3. The method of claim 1 wherein further comprising:
 - applying two DCT filters to the rows of pixels of each macroblock to generate two horizontal arranged up-sampled macroblocks; and
 - applying the two DCT filters to the columns of pixels of each horizontally arranged up-sampled macroblock to generate two vertically arranged up-sampled blocks for each horizontally arranged up-sampled macroblock for a total of four up-sampled macroblocks.

4. The method of claim 3 wherein pixels of the up-sampled macroblocks are determined by matrix multiplications.
5. The method of claim 4 wherein each filter is a form of a $k \times q$ matrix of filter taps, where k is an index of an output pixel and q is an index of an input pixel.
6. An apparatus for up-sampling a compressed bitstream, comprising:
 - means for partially decoding the compressed bitstream to produce a plurality of macroblocks, each macroblock having DCT coefficients according to a predetermined dimensionality of the macroblock; and
 - means for applying a plurality of DCT filters to the DCT coefficients of each macroblock to generate a plurality of up-sampled macroblocks for each macroblock, there being one up-sampled macroblock generated by each filter, each up-sampled macroblock having the predetermined dimensionality.